

REMARKS

The Office Action dated May 29, 2006 has been received and carefully studied.

The Examiner objects to the drawings for failing to include reference numeral 29 mentioned in the specification on page 14, line 7. By the accompanying amendment, the reference to element 29 and figure 6 has been deleted.

The Examiner objects to the drawing under 37 C.F.R. §1.83(a) as failing to show the center of buoyancy and the center of gravity separated from each other along the axis. By the accompanying amendment, claim 8, which recites this language, has been cancelled.

The Examiner objects to the drawing under 37 C.F.R. §1.83(a) as failing to show the display for displaying the presence of leaks. By the accompanying amendment, claim 27 has been amended to eliminate this language.

The Examiner objects to the drawing under 37 C.F.R. §1.83(a) as failing to show the emitters and/or detectors along the pipe. By the accompanying amendment, claim 25 (and claims 24 and 26) have been amended to refer to the transmitter/receiver 37 which is shown in Figure 1 and referred to in lines 4 and 11 on page 14 of the specification.

The Examiner objects to the drawings under 37 C.F.R. §1.84(p)(4) because reference characters "5" and "9" have both been used to designate a pill. The objection is respectfully traversed. Reference character "9" is shown in Figure 4 to indicate the acoustic hydrophone inside the pill 5, and thus the lead line extending from reference character "9" penetrates the pill 5.

The Examiner objects to the specification on page 14, line 7. By the accompanying amendment, the incorrect reference to Figure 6 has been deleted.

The Examiner rejects claims 1, 5, 9, 11, 17-19, 21, 22, 32 and 33 under 35 U.S.C. §102(b) as being anticipated by Mizuochi, JP 62-025229A, claims 2, 3, 6-8, 20, 23 and 27 under 35 U.S.C. §103(a) as being unpatentable over Mizuochi, and claims 12-16 and 24-26 as being unpatentable over Mizuochi in view of Guest, U.S. Patent No. 3,691,819.

By the accompanying amendment, claim 1 has been amended to recite that with respect to the neutral buoyancy of the device, the device has substantially neutral buoyancy in the fluid passing through the pipeline so as to be positioned within the fluid and be swept along the pipeline by the fluid downstream to a retrieval point. A similar amendment has been made to method claim 17.

An important difference between the present invention and both Mizuochi and Guest is that in both cited documents the leak detection device which passes along the pipeline interior relies upon contact with the inner wall of the pipeline to guide the movement. In Mizuochi, the external dimensions of the device are such as to contact the inner wall of the pipeline as shown in Figure 1. Contact with the internal surface of the pipeline causes problems in the form of dislodgement of debris from the pipeline which contaminates the fluid therein and may cause the fluid to be unusable for a significant period of time. The contact with the internal surface of the pipeline may also cause the creation of noise, which can mask or render the signals indicative of leakage unclear. It is therefore only the detection device of the current invention which can be said to swept along by the fluid so as to travel continuously within the flow of fluid along the pipeline inasmuch that the device is not required to contact the pipeline walls and is not intended to contact the pipeline walls.

Guest does not supply this deficiency of Mizuochi. In Guest, specific guides are biased into contact with the internal surface of the pipeline and the device is required to be controlled so as to be stopped and started upon the detection of leakage. As the device in the current

invention is provided to be propelled solely by the flow of the fluid, the device moves continuously along with the fluid along the pipeline and therefore cannot be stopped and started as is required in Guest.

The continuous movement of the device in the current invention along the pipeline without needing to contact the internal walls of the pipeline is achieved by providing the device with substantially neutral buoyancy with respect to the liquid passing along the pipeline. This means that the device does not float to the top of the liquid and therefore contact along the top internal face of the pipeline and also does not sink in the liquid to contact the bottom internal face of the pipeline. Instead the device is positioned within the liquid, substantially centrally of the pipeline without the need for guide means to be provided or for the device to have the same dimension as the pipeline walls so as to position the same. The features of the device which allow this inventive feature to be obtained are detailed in Claims 1 and 17.

The Examiner also suggests that the device of Mizuochi has neutral buoyancy as the device travels along the pipeline by applying liquid pressure. Applicants respectfully submit that this is incorrect. The description does no more than suggest that the flow of the liquid can

be used to propel the device along the pipeline. It does not suggest that the device will be carried by and within the liquid due to neutral buoyancy. Instead it suggests that the device will be too heavy so that the same will sink, and this is the reason why the device has to contact the internal walls of the pipeline to locate the same. The device effectively acts as a plug in the pipeline so as to cause sufficient pressure of liquid to be created behind it so as to cause the device to be pushed along the pipeline.

The Examiner also rejects claims 1, 5, 9, 11, 17-19, 21, 22, 32 and 33 under 35 U.S.C. §102(b) as being anticipated by Mitsuoka, JP 58-042946A.

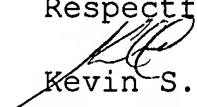
With regard to Mitsuoka, there is no detailed disclosure of the buoyancy (or otherwise) of the device which passes along the pipeline, and once again the Examiner has asserted that the device will have neutral buoyancy. Applicants again respectfully submit that the Examiner is incorrect in making this assertion. It is clear from this document that the device comprises a series of parts 2A, 2B, 2C which are joined together rather than one self-contained unit as in claim 1 of the current application. In fact part 2a carries the microphone, part 2B carries a timer and part 2C carries the memory. This document does not disclose a means for the location of the

continuously moving device to be detected as it moves along the pipeline as is set out in amended claim 1 in which the device includes a receiver/transmitter (as detailed on page 13 line 20 of the description). The provision of the receiver/transmitter means that the location of the device with respect to the pipeline can be determined.

Accordingly, none of the cited primary references discloses or suggests a self-contained device which has neutral buoyancy and which can therefore be wholly propelled by the flow of the fluid. None shows a device which can be used to transmit and receive signals as it is carried by the flow of fluid along the pipeline so as to allow the location of the device to be determined. Guest does not show a device which can be moved along the pipeline by and within the liquid and the location of which can be determined with respect to the pipeline and hence the location of any leakage which is detected as the device moves along the pipeline can be calculated.

Reconsideration and allowance are respectfully requested in view of the foregoing.

Respectfully submitted,


Kevin S. Lemack
Reg. No. 32,579
176 E. Main Street - Suite 7
Westboro, Massachusetts 01581
TEL: (508) 898-1818